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| 10/764,444  | 01/27/2004  | Yorimichi Dairoku    | 1035-492            | 8698             |
| 23117 7590 03/17/2010<br>NIXON & VANDERHYE, PC<br>901 NORTH GLEBE ROAD, 11TH FLOOR<br>ARLINGTON, VA 22203 |             |                      |                     |                  |
| EXAMINER  |             |                      |                     |                  |
| HUSON, MONICA ANNE  |             |                      |                     |                  |
| ART UNIT  |             | PAPER NUMBER         |                     |                  |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/764,444

**Applicant(s)**

DAIROKU ET AL.

**Examiner**

MONICA A. HUSON

**Art Unit**

1791

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 January 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3 and 6-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 6-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)  
Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

This office action is in response to the Remarks filed 4 January 2010.

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 6-11, 13-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Golander et al. (U.S. Patent 4,840,851), in view of Vesley et al. (U.S. Patent 6,960,275).

Regarding Claims 1, 19, and 20-21, Golander et al., hereafter "Golander," show that it is known to carry out a method of manufacturing a water-absorbing shaped body (Column 8, line 40), comprising the step of polymerizing an aqueous solution without the presence of a thickening agent and including a photo polymerization initiator, a radical polymerization initiator and a water-soluble ethylenically unsaturated monomer containing an amount of acrylic acid by radiating light onto the aqueous solution (Abstract, Claim 28 (radical initiator); Column 2, lines 62-64; Column 7, lines 11-26; Column 8, line 65; Column 9, lines 7-9; Example 1; note that Golander does not use a thickening agent), shaping the polymerized aqueous solution, and drying the water-absorbing shaped body obtained after polymerization (Example 6; Column 7, lines 13-33). Golander does not specifically show at least 50 mol% (Claim 1), at least 80 mol% (Claim 19), or at least 95 mol% (Claim 20) however he does show using acrylic acid in equimolar amounts with another reactant in Example 7. Therefore, it is interpreted that the amounts of acrylic acid are recognized as variable, and where the general

conditions of a claim are disclosed by the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation (See MPEP 2144.05 (II)(A)). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use any appropriate mol% of acrylic acid in Golander's molding process in order to most effectively carry out the polymerization reaction. Further, Golander does not show applying heat after the light radiation. Vesley et al., hereafter "Vesley," show that it is known to carry out a method of making an absorbent article wherein polymerization is furthered by applying heat after the light is radiated intermittently (Column 5, lines 16-18, 52-53, especially note that Vesley teaches a curing method of application of radiation or application of heat at lines 16-18, and Vesley teaches that a subsequent curing (e.g., after first application of radiation) can take place by a second energy source (e.g., heat) at lines 52-53). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use Vesley's heat after the light radiation step in Golander in order to perfect the polymerization and fix the article's physical characteristics.

Regarding Claim 2, Golander shows the process as claimed as discussed in the rejection of Claim 1 above, including a method wherein the aqueous solution is polymerized on a surface of another base material (Column 2, lines 55-57).

Regarding Claim 3, Golander shows the process as claimed as discussed in the rejection of Claim 1 above, including a method wherein the aqueous solution before the light is radiated includes a cross linking agent in advance (Column 3, lines 50-57).

Regarding Claim 6, Golander shows the process as claimed as discussed in the rejection of Claim 1 above, wherein the aqueous solution is shaped into a film shape (Example 6).

Regarding Claims 7, 18, and 22, Golander shows that it is known to carry out a method of manufacturing a water absorbing shaped body (Column 8, line 40), comprising the step of a first polymerization step of radiating light onto an aqueous solution not containing a thickening agent and including a photo polymerization initiator and a water-soluble ethylenically unsaturated monomer, so as to polymerize a part of the water soluble ethylenically unsaturated monomer to thicken the aqueous solution

(Column 7, lines 10-17; note that Golander does not use a thickening agent), and a second step of radiating light onto the aqueous solution having a shape so that a rest of the water soluble ethylenically unsaturated monomer is polymerized, the aqueous solution having been shaped and including the polymer as a part thereof (Column 7, lines 18-26). Golander does not show an intermediate shaping step. Vesley shows that it is known to carry out a method of forming an absorbent article including a first polymerization step, a shaping step of stopping radiation of light and shaping the article into a desired shape, and a final polymerization step (Figure 1, element 114=first curing, space between 114 and 126=shaping step after curing is stopped, 126=second curing; Column 5, lines 41-65; Column 8, lines 21-49). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use Vesley's intermediate shaping step during Golander's molding process in order to allow the article to be shaped without the curing conditions' influence. Golander does not specifically show at least 50 mol%, however he does show using acrylic acid in equimolar amounts with another reactant in Example 7. Therefore, it is interpreted that where the general conditions of a claim are disclosed by the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation (See MPEP 2144.05 (II)(A)). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use any appropriate mol% of acrylic acid in Golander's molding process in order to most effectively carry out the polymerization reaction.

Regarding Claim 8, Golander shows the process as claimed as discussed in the rejection of Claim 7 above, including a method wherein the aqueous solution before the light is radiated includes a cross linking agent in advance (Column 3, lines 50-57), meeting applicant's claim.

Regarding Claim 9, Golander shows the process as claimed as discussed in the rejection of Claim 7 above, but he does not show a shaping step. Vesley shows that it is known to carry out a method of forming an absorbent article including a first polymerization step, a shaping step of stopping radiation of light and shaping the article into a desired shape, and a second polymerization step of the article which is being

shaped (Figure 1, element 104, 114, 126; Column 5, lines 41-65; Column 8, lines 21-49). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use Vesley's intermediate shaping step during Goldander's molding process in order to impart the desired physical details to the molded article.

Regarding Claim 10, Golander shows the process as claimed as discussed in the rejection of Claim 7 above, including a method wherein the aqueous solution further includes a radical polymerization initiator other than the photo polymerization initiator (Claim 28), meeting applicant's claim.

Regarding Claim 11, Golander shows the process as claimed as discussed in the rejection of Claim 7 above, but he does not show applying heat after the light radiation. Vesley shows that it is known to carry out a method of making an absorbent article wherein polymerization is furthered by applying heat after the light is radiated (Column 5, lines 16-18, 52-53). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use Vesley's heat after the light radiation step in Golander in order to perfect the polymerization and fix the article's physical characteristics.

Regarding Claim 13, Golander shows the process as claimed as discussed in the rejection of Claim 7 above, but he does not show a shaping step. Vesley shows that it is known to carry out a method wherein the shaping step is performed right after the first polymerization step (Figure 1, element 104, 114). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use Vesley's shaping step after the first polymerization step of Golander's molding method in order to form desired details into the thickened semi-polymerized article.

Regarding Claim 14, Golander shows the process as claimed as discussed in the rejection of Claim 7 above, but he does not show a continuous belt. Vesley shows that it is known to carry out a method wherein the first polymerization step and the shaping step are performed on a continuous belt (Figure 1, element 106). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use Vesley's continuous belt during Golander's molding process because continuous processes are more efficient and produce more articles per time frame.

Regarding Claim 15, Golander shows the process as claimed as discussed in the rejection of Claim 7 above, wherein the aqueous solution is shaped into a film shape (Example 6), meeting applicant's claim.

Regarding Claims 16 and 17, Golander shows the process as claimed as discussed in the rejection of Claims 6 and 15, respectively, but he does not show a porous article. Vesley shows that it is known to carry out a method wherein the water absorbing shaped body is permeable (Column 6, lines 55-67; Column 7, lines 1-9; permeable~porous). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use Vesley's permeable article as that during Golander's molding process in order to allow passage of desired fluids through the water absorbing body.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Golander and Vesley, further in view of Phan et al. (U.S. Patent 6,022,610). Golander shows the process as claimed as discussed in the rejection of Claim 7 above, but he does not show a fiber substrate. Phan et al., hereafter "Phan," teaches a method for adding a water absorbent polymer congruent in shape to a capillary substrate (fiber base material) (abstract and col. 1, lines 33-39; 44-51 and col. 4, lines 10-22). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a capillary substrate (fiber base material), as taught by Phan in the method of Golander because the capillary substrate (fiber base material) will have increased absorbent qualities.

### ***Response to Arguments***

Applicant contends that Golander is not applicable because he does not show the claimed method of shaping a partially crosslinked gel. This is not persuasive because shaping a partially crosslinked *gel* (emphasis added) is not claimed. As noted above, it is maintained that Golander suggests using the same polymers as claimed.

Applicant contends that Vesley does not show an initial radiation, stopping the radiation, shaping the solution, and applying radiation again. This is not persuasive, as

seen by the following notes about Figure 1, along with the disclosure at Column 5, lines 16-56 and Column 7, lines 61-65. Vesley's elements 114 provide the initial radiation step. Then, relative to the composition itself, once the composition moves beyond (to the left, clockwise movement) elements 114, radiation is stopped, i.e. there is no more radiation being applied to the composition. While the composition is being transported on the roll, and at nip 124, shaping is being imparted to the composition (see also, Column 8, lines 22-49). (Note that a shape change is not necessarily claimed.) Then, Vesley's element 126 provides radiation to the composition again, i.e. second curing/polymerization. Based on this analysis of Vesley, it is maintained that he suggests the claimed steps for which his disclosure is applied.

Applicant contends that Golander does not show the claimed at least 50mol%, 80mol%, or 95mol% of acrylic acid, an acrylic acid salt, or both. This is not persuasive because, as noted in the body of rejection, these specific amounts are being held as variants which would have been obvious to one of ordinary skill in the art.

Applicant contends that Golander's radical initiator is not applicable because he shows different materials. This is not persuasive because, as noted above, it is maintained that Golander suggests using the same polymers as claimed. It is noted that Vesley was not cited to show a free radical polymerization initiator.

Applicant contends that Golander and Vesley do not suggest the instant invention because they do not show applying heat after the light is radiated. This is not persuasive because at Column 5, lines 16-18 and 52-55, Vesley shows that element 126 can apply heat to the composition after light has been radiated by element 114. It is maintained that Golander and Vesley would reasonably combine to suggest this feature of the instant invention.

Applicant contends that Golander and Vesley do not suggest the instant invention because they do not show drying the shaped body. This is not persuasive, as it is interpreted that open-air drying implicitly takes place between Vesley's elements 126 and when the composition is wound onto roll 120.

With regard to claim 12, applicant contends that Golander, Vesley, and Phan do not combine to suggest the claimed subject matter because there is no indication that



such a combination would work. This is not persuasive, as all references are concerned with absorbent polymers, there is a reasonable expectation of success. It is maintained that Phan shows the fiber substrate, and that Golander, Vesley, and Phan would reasonably combine to suggest the claimed invention.

As a courtesy to applicant, the examiner has done a baseline search for the features of a drying machine and a process for polymerizing wherein intermittent application of light from one source; these features were suggested as progressive claim clarifications in the Interview on 27 January 2010 (see Summary mailed 2 February 2010). Based on her search results, the examiner cites the patents below as general findings with regard to use of a drying machine to dry a shaped body. The examiner encourages applicant to consider clarifying the claims regard to polymerizing wherein intermittent application of light comes from one source, if such a clarification is supported by the originally-filed specification. The examiner will update her search as necessary based on any amendment that is officially filed. Applicant is reminded that any subsequent amendment will be after prosecution has been closed, and therefore any amendment that does not place the application in condition for allowance and presents new grounds for rejection may not be entered.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following patents are cited to show the state of the art with regard to drying a shaped body subsequent to polymerizing by radiation using a drying machine:

U.S. Patent 6,103,316 to Tran et al.

U.S. Patent 5,785,784 to Chesley et al.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MONICA A. HUSON whose telephone number is (571)272-1198. The examiner can normally be reached on Monday-Friday 7:00am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on 571-272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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